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USFS, Fishlake NF

## **Cooperators and Partnerships**

Ashley National Forest
Dixie National Forest
Fishlake National Forest
Manti LaSal National Forest
Bureau of Land Management
Uncompanger Partnership
Utah Division of Wildlife
Rocky Mountain Research Station
Southern Utah University

## Timeline of Major Events

- 2005-06 --- Discuss the feasibility of an Adaptability Study within The Region Four Forests, decide on how many sites and how many plants and what species. Indian ricegrass, muttongrass, needle and thread grass, junegrass, squirreltail, and Sandberg bluegrass were chosen.
- •2007-08 --- Contracted a Seed Collector to collect target species within the four major forest regions.
- •2008 --- Pared down the collections to a manageable number, by using elevation, soil type, plant associations, etc. Selected four sites, one on each Forest, Ashley, Dixie, Fishlake, Manti, and used the site at Nephi as a BLM sponsored site. Sites were two acres in size and were mowed and fenced. Seed was cleaned and taken to a grower to produce 200 transplants of each accession.

## **Timeline of Major Events**

- •2009 --- Spring, Applied herbicide to all plots in two applications and then began to plant in late May. Order was as follows, Nephi, Manti, Fishlake, Dixie, and Ashley. We finished planting by the end of June. Followed up with weeding by hand and some herbicide applications in the fall. Some watering was done at the Nephi plot but precipitation followed after all other planting for needed establishment.
- •2010 --- Recorded survival for all plots, weeded as needed, recorded plants that flowered and bolted into seedheads, Measured for biomass and took photo records.

## Timeline of Major Events

2011---Checked on survival in the spring. Installed solar powered weather stations on each location with 10 sensors. Monitored life history of plants through the growing season. Recorded measurements of height and crown at maximum growth. Cut plants for biomass measurement and stored each sample in a separate paper bag. Took a photo of each plant in all locations. Stored and dried the plant samples until dry. Began to weigh and record the weights of the plants biomass and separated and recorded the number of seed heads for each plant. Will organize and analyze data and move forward into 2012 with the top performers for each species. D90-7-9



### Ashley "Dutch John" site

Site Description

Elevation 6360 feet

Community- sagebrush, pinyon/juniper, native perennial bunchgrass and some introduced crested wheatgrass.

Dixie "Slaughter Flat" site

Slaughter Flat Site Description

Elevation 7400 feet

Community- sagebrush, pinyon juniper, with native perennial bunchgrass and some introduced crested wheatgrass.

#### Fishlake "Paradise Flat" site

Site Description

Elevation 7800 feet

Community- sagebrush, needle and thread grass, blue grame and some introduced crested wheatgrass.

## Manti "Joe's Valley" Site

**Site Description** 

Elevation—6900 feet

Community---sagebrush, grass, mostly crested wheatgrass and some native grasses.

This is the only site that had survival of all species in the study.

### Nephi "BLM" Site

Site Description

Elevation—5253 feet

Community---This site is the Utah State Extension Service Agricultural Farm located south of Nephi about 2.5 miles, it has been under dryland farming for numerous years and is basically a weed free site.

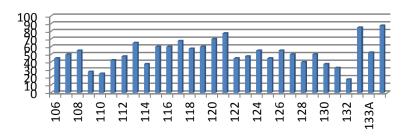


# Summary of All Plots, Top Five of Each Specie

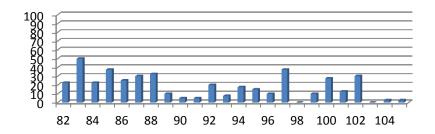
Specie	S	Origin	Elev.	Collection #	Plant #	Survival 2010	Survival 2011	Rank 2011
Koma	1	UP Project	7847	C2-03	55	47.8	45.5	1
	2	Dixie	9598	Koma20	41	43.2	33	6
	3	Manti	7414	Koma4	45	42.2	37	3
	4	Fishlake	10295	F07	50	40.6	33.5	4
	5	Manti/Moab	8355	MO15	46	38.8	30.5	8
Pofe	1	Fishlake	7425	Pofe5	78	54.4	42.5	2
	2	UP Project	7000	C6-05	81	52.6	46.5	1
	3	Dixie	9515	D24	66	52.3	39	4
	4	Ashley	8557	Pofe8	59	47.6	40.5	3
	5	Manti/Moab	6256	МО9	72	46.2	36.5	6

Sp	ecies	Origin	Elevation	Coll. #	Plant #	Survival 2010	Survival 2011	Rank 2011
8				TAKAS		ALEXAND I		
Pos	se 1	High Plains			133	84	73.5	1
	2	Manti	10,355	Pose5	117	73.5	51	5
	3	VNS			133B	70.5	65	2
	4	Ashley	7056	Pose10	108	67.25	62	3
	5	Dixie	9515	D24	115	65.75	58.5	4
Stc	o 1	Dixie	7417	07P5	87	64.6	58.6	2
	2	Manti/Moab	6363	MO5	92	63.6	54.5	3
	3	UP Project	7944	Jacks Canyon	102	62.2	61	1
	4	Escalante G.S.M.	4643	K1	100	60.4	52.3	4
	5	UP Project	5924	Shavano	104	59.2	40.9	5
Ele	l 1	Manti/Moab	7951	MO16	145	37.8	35.6	5
	2	Fishlake	8223	FO4	147	34.8	41.8	1
	3	Dixie	9515	D24	141	33.8	38.1	4
	4	Dixie	7867	07P3	138	32.4	38.7	3
	5	Fishlake	7883	Stco2	149	32.2	39.3	2

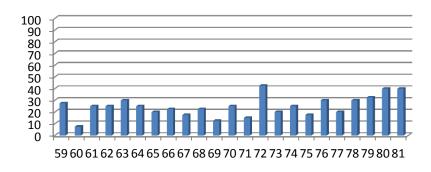
### Sandberg Bluegrass Fish Lake Enclosure



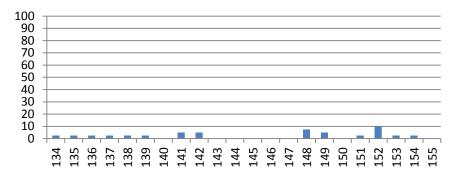
### Needle and Thread Fish Lake Enclosure



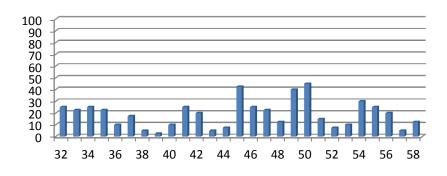
### **Muttongrass Fish Lake Enclosure**



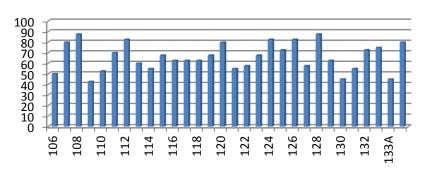
#### **Squirreltail Fish Lake Enclosure**



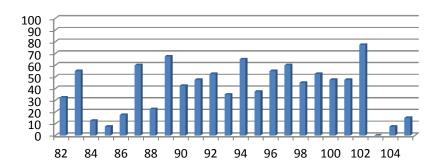
#### **Junegrass Fish Lake Enclosure**



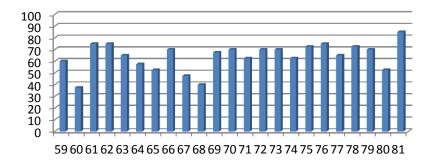
#### **Sandberg - Manti Enclosure**



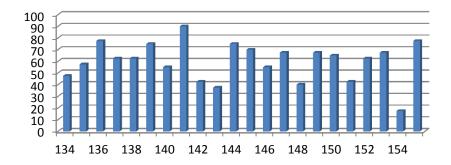
#### **Needle Thread - Manti Enclosure**



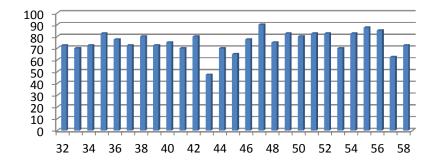
#### **Muttongrass - Manti Enclosure**



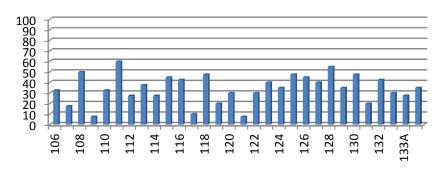
### **Squirreltail - Manti Enclosure**



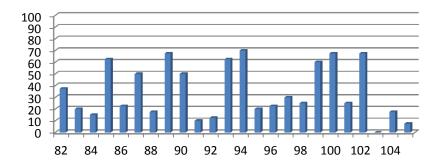
#### **Junegrass - Manti Enclosure**



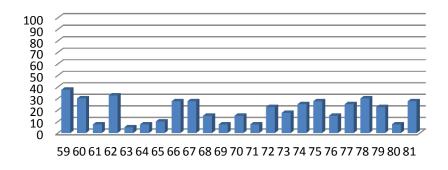
#### **Sandberg - Ashley Enclosure**



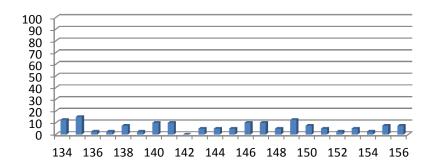
#### **Needle Thread - Ashley Enclosure**



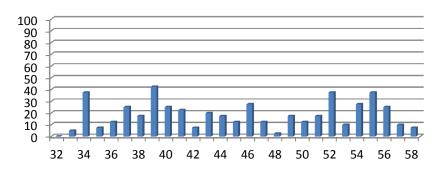
#### **Muttongrass - Ashley Enclosure**



#### **Squirreltail - Ashley Enclosure**



### **Junegrass - Ashley Enclosure**



Poa secunda

•Sandberg Bluegrass was a strong performer at all sites.



Native perennial bunch grass

- •Sandberg Bluegrass was a strong performer at all sites.
- •Persists and becomes co-dominant with cheat grass (*Bromus tectorum*) in the drier portions of the Intermountain region.



Cheat grass (Bromus tectorum)



- •Sandberg Bluegrass was a strong performer at all sites.
- •Persists and becomes co-dominant with cheat grass (*Bromus tectorum*) in the drier portions of the Intermountain region.
- •Less damaged by fire than other native grasses



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- •Persists and becomes co-dominant with cheat grass (*Bromus tectorum*) in the drier portions of the Intermountain region.
- •Less damaged by fire than other native grasses
- •Cheatgrass has a higher growth rate than Sandberg Bluegrass at 10°C.



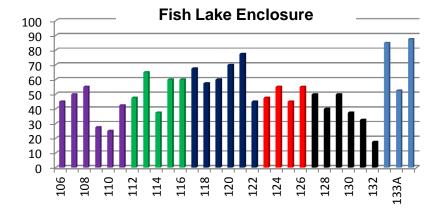
- •Sandberg Bluegrass was a strong performer at all sites.
- •Persists and becomes co-dominant with cheat grass (*Bromus tectorum*) in the drier portions of the Intermountain region.
- Less damaged by fire than other native grasses
- •Cheatgrass has a higher growth rate than Sandberg Bluegrass at 10°C.
- •Sandberg Bluegrass has a higher growth rate than Cheatgrass at 20°C.

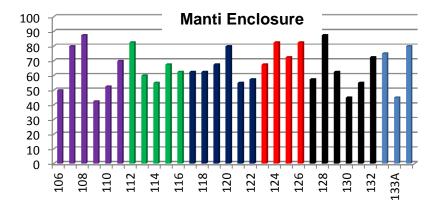


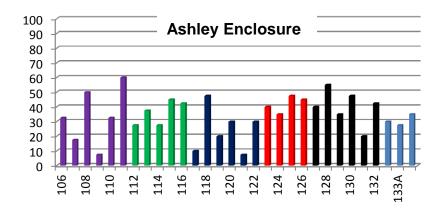
Poa secunda

#### **Accession**

Number	Site Originally Collected
106	Ashley
107	Ashley
108	Ashley
109	Ashley
110	Ashley
111	Ashley
112	Dixie
113	Dixie
114	Dixie
115	Dixie
116	Dixie
117	Manti/Manti
118	Manti/Manti
119	Manti/Manti
120	Manti/Moab
121	Manti/Moab
122	Manti/Moab
123	Fishlake
124	Fishlake
125	Fishlake
126	Fishlake
127	UP Project
128	UP Project
129	UP Project
130	UP Project
131	UP Project
132	UP Project
133	Released
133A	Released
133B	Released







# Sandberg Bluegrass Poa secunda

Location of the original collection site did not impact the survivablility of Sandberg Bluegrass accessions.



# Squirretail Elymus elymoides

•Squirreltail did not perform well in two out of three sites

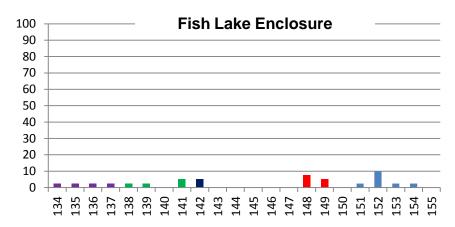


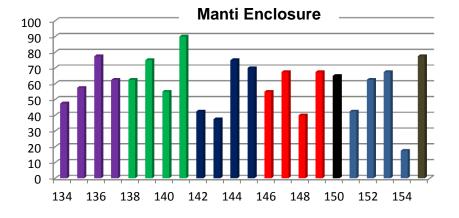
## **Squirretail**

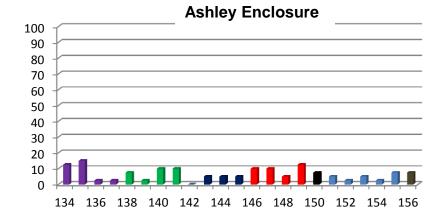
Elymus elymoides

#### **Accession**

d







# Squirretail Elymus elymoides

- •Squirreltail did not perform well in two out of three sites.
- Location of original collection did not effect survivability of Squirretail.



# Muttongrass Poa fendleriana

•Muttongrass performed well at the Manti site but had only marginal survivability at other sites.

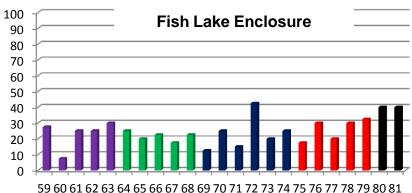


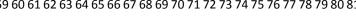
## **Muttongrass**

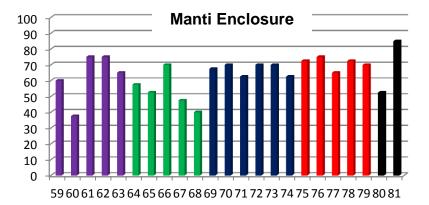
Poa fendleriana

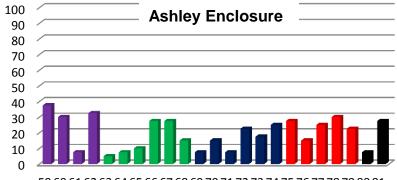
#### **Accession**

Number	Site Originally Collected
59	Ashely
60	Ashely
61	Ashely
62	Ashely
63	Ashely
64	Dixie
65	Dixie
66	Dixie
67	Dixie
68	Dixie
69	Manti/Manti
70	Manti/Manti
71	Manti/Manti
72	Manti/Moab
73	Manti/Moab
74	Manti/Moab
75	Fishlake
76	Fishlake
77	Fishlake
78	Fishlake
79	Fishlake
80	UP Project
81	UP Project









59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81

## **Muttongrass**

Poa fendleriana

- •Muttongrass performed well at the Manti site but had only marginal survivability at other sites.
- •Location of original collection did not effect survivability of Muttongrass.



## **Needle and Thread**

Hesperostipa comata

Needle and Thread grass performed moderately well at two out of three sites.

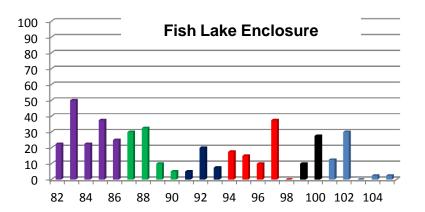


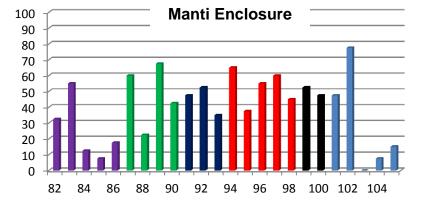
## **Needle and Thread**

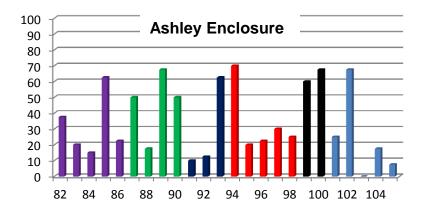
Hesperostipa comata

#### Accession

Accession	
Number	Site Originally Collected
82	Ashley
83	Ashley
84	Ashley
85	Ashley
86	Ashley
87	Dixie
88	Dixie
89	Dixie
90	Dixie
91	Manti/Manti
92	Manti/Moab
93	Manti/Moab
94	Fishlake
95	Fishlake
96	Fishlake
97	Fishlake
98	Fishlake
99	Escalante
100	Escalante
101	UP Project
102	UP Project
103	UP Project
104	UP Project
105	UP Project







## **Needle and Thread**

Hesperostipa comata

- •Needle and Thread grass performed moderately well at two out of three sites.
- Location of original collection did not effect survivability of Needle and Thread grass.



# Prairie Junegrass Koeleria macrantha

Junegrass only performed well at Manti site.

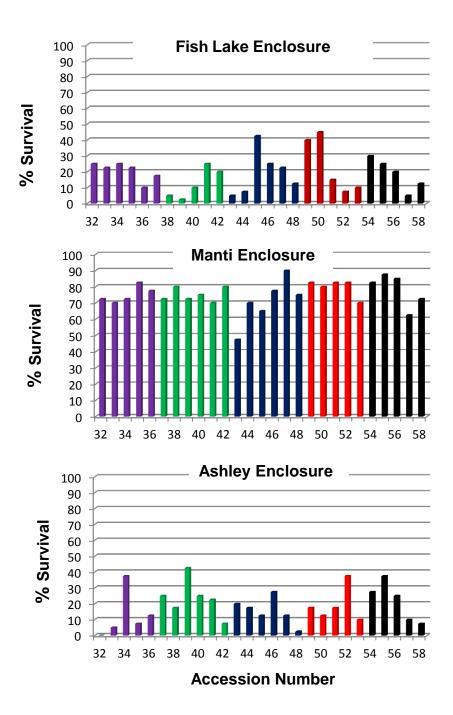


## **Prairie Junegrass**

Koeleria macrantha

#### **Accession**

Number	Site Originally Collected
32	Ashley
33	Ashley
34	Ashley
35	Ashley
36	Ashley
37	Ashley
38	Dixie
39	Dixie
40	Dixie
41	Dixie
42	Dixie
43	Manti/Manti
44	Manti/Manti
45	Manti/Manti
46	Manti/Moab
47	Manti/Moab
48	Manti/Moab
49	Fishlake
50	Fishlake
51	Fishlake
52	Fishlake
53	Fishlake
54	UP Project
55	UP Project
56	UP Project
57	UP Project
58	UP Project



# **Prairie Junegrass**

Koeleria macrantha

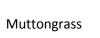
- •Junegrass only performed well at Manti site.
- •Location of original collection did not effect survivability of Junegrass.



Squirretail Elymus elymoides

2012 Research

•We will do germination demonstrations of 5 grasses





Sandberg bluegrass Poa secunda



Indian Ricegrass
Oryzopsis hymenoides



**Praire Junegrass** *Koeleria macrantha* 



#### 2012 Research

- •We will do germination demonstrations of 5 grasses.
- •Nonnatives that are typically used for revegetation will be planted as controlls.

Siberian Wheatgrass Agropyron fragile



Siberian Wheatgrass *Agropyron fragile* 



Crested Wheatgrass Agropyron cristatum



#### 2012 Research

- •We will do germination demonstrations of 5 grasses.
- •Nonnatives that are typically used for revegetation will be planted as controlls.
- •Demonstration seedings will be done on bare, burned and retardant cover soil.



	Bur	ned	Non- Burned		
	Broadcast	Scarified	Broadcast	Scarified	
10 feet	Retardant	Straw	Control	Straw and Retardant	
set	Straw	Control	Straw	Retardant	
40 feet	Straw and Retardant	Retardant	Straw and Retardant	Control	
	Control	Straw and Retardant	Retardant	Straw	
	30 feet 120 feet				

The nine lines going down through the plots are represented by each of the nine grasses which are; muttongrass, sandberg bluegrass, squirreltail, Indian ricegrass, needle and thread grass, prairie junegrass, crested wheatgrass, intermediate wheatgrass, Russian wildrye.

Scientific name abbr.		Seeding rate	seeding rate in grams	total needed in grams if %100 PLS	total number of seeds	number of seeds per foot
	Common Name					
Achy	Indian ricegrass	12lb	5448g	80g	24845	207
Agcr	crested wheatgrass	7lb	3178g	46g	20264	169
Elel	squirreltail	14lb	5448g	80g	33832	282
Hest	needle and thread	2lb	6356g	93g	23557	196
Koma	prairie junegrass	2lb	908g	13g	66300	553
Pofe	Muttongrass	3lb	1362g	20g	39207	328
Pose	Sandberg bluegrass	4lb	1820g	27g	55011	458
Psju	Russian wildrye	10lb	4540g	66g	25440	212
Thin	Intermediate wheatgrass	15lb	6810g	99g	19189	160